

A2CC Quarter 1 Test 2 Review Key

$$(*) i^2 = -1$$

$$1) 32^x = 8$$

$$(2^5)^x = 2^3$$

$$2^{5x} = 2^3$$

$$\frac{5x}{5} = \frac{3}{5}$$

$$\boxed{x = \frac{3}{5}}$$

$$2) (6+9i) - (-4-2i)$$

$$6+9i + 4+2i$$

$$\boxed{10+11i}$$

$$3) (-3+6i)(3+5i)$$

$$-9-15i+18i+30i^2$$

$$-9-15i+18i+30(-1)$$

$$\boxed{-9-15i+18i-30}$$

$$\boxed{-39+3i}$$

$$4) 4y^{\frac{2}{3}} - 5 = 20$$

$$\frac{4y^{\frac{2}{3}}}{4} = \frac{25}{4}$$

$$y^{\frac{2}{3}} = \frac{25}{4}$$

$$\boxed{y = \frac{125}{8}}$$

$$5) 2\sqrt{-196} - 3\sqrt{-225}$$

$$2i\sqrt{196} - 3i\sqrt{225}$$

$$2i(14) - 3i(15)$$

$$2i \cdot 14 - 45i$$

$$28i - 45i$$

$$\boxed{-17i}$$

Take out the
(-) as "i"

$$6) i^{2001} = \boxed{i}$$

$$2001 \div 4 = 500.25$$

$$7) \left(\frac{1}{3}\right)^{1-x} = 9$$

$$(3^{-1})^{(1-x)} = 3^2$$

$$3^{-1+x} = 3^2$$

$$\frac{-1+x}{+1} = \frac{2}{+1}$$

$$\boxed{x=3}$$

$$8) a^{-\frac{2}{5}} = \frac{1}{a^{\frac{2}{5}}} = \boxed{\frac{1}{\sqrt[5]{a^2}}}$$

$$9) \sqrt{90} + \sqrt{40}$$

$$\sqrt{9}\sqrt{10} + \sqrt{4}\sqrt{10}$$

$$3\sqrt{10} + 2\sqrt{10}$$

$$\boxed{5\sqrt{10}}$$

$$10) \sqrt{98} - 2\sqrt{18}$$

$$\sqrt{49}\sqrt{2} - 2\sqrt{9}\sqrt{2}$$

$$7\sqrt{2} - 2 \cdot 3\sqrt{2}$$

$$7\sqrt{2} - 6\sqrt{2}$$

$$\boxed{1\sqrt{2}}$$

$$11) 2\sqrt{5} \cdot \sqrt{15}$$

$$2\sqrt{75}$$

$$2\sqrt{25}\sqrt{3}$$

$$2 \cdot 5\sqrt{3}$$

$$\boxed{10\sqrt{3}}$$

$$12) \frac{6\sqrt{60}}{24\sqrt{3}} = \frac{1\sqrt{20}}{4} = \frac{\sqrt{4}\sqrt{5}}{4} = \frac{2\sqrt{5}}{4} = \boxed{\frac{\sqrt{5}}{2}}$$

$$13) \sqrt{3}(2\sqrt{27} - \sqrt{6}) = 2\sqrt{81} - \sqrt{18}$$

$$2 \cdot 9 - \sqrt{9}\sqrt{2}$$

$$\boxed{18 - 3\sqrt{2}}$$

$$14) (2+\sqrt{5})(3-\sqrt{5})$$

$$6 - 2\sqrt{5} + 3\sqrt{5} - \sqrt{25}$$

$$6 - 2\sqrt{5} + 3\sqrt{5} - 5$$

$$6 + 1\sqrt{5} - 5$$

$$\boxed{1 + 1\sqrt{5}}$$

$$15) \left(\frac{3}{5}\right)\sqrt{75a^4b^6c} - \frac{1}{2}\sqrt{192a^4b^6c}$$

$$\sqrt{25a^4b^6}\sqrt{3c} \quad \sqrt{64a^4b^6}\sqrt{3c}$$

$$\frac{3}{5} \cdot 5a^2b^3\sqrt{3c} - \frac{1}{2} \cdot 8a^2b^3\sqrt{3c}$$

$$3a^2b^3\sqrt{3c} - 4a^2b^3\sqrt{3c}$$

$$\boxed{-a^2b^3\sqrt{3c}}$$

Cube roots

$$16) 18\sqrt[3]{32y^7} + 6\sqrt[3]{4y}$$

$$\sqrt[3]{8y^6}\sqrt[3]{4y}$$

$$18 \cdot 2y^2\sqrt[3]{4y}$$

$$\boxed{36y^2\sqrt[3]{4y} + 6\sqrt[3]{4y}}$$

$$17) 3\sqrt[3]{4a^3} - 6\sqrt[3]{9a^3}$$

$$\sqrt[3]{4a^3}\sqrt[3]{1} \quad \sqrt[3]{9a^3}\sqrt[3]{1}$$

$$3 \cdot 2a\sqrt[3]{1} - 6 \cdot 3a\sqrt[3]{1}$$

$$6a\sqrt[3]{1} - 18a\sqrt[3]{1}$$

$$\boxed{-12a\sqrt[3]{1}}$$

$$18) \left(\frac{12x^4y^2}{1} \right)^2 \left(\frac{xy}{2} \right) = \left(\frac{12^2(x^4)^2(y^2)^2}{1} \right) \left(\frac{xy}{2} \right) = \frac{144x^8y^4}{1} \cdot \frac{xy}{2} =$$

$$= \frac{144x^{13}y^5}{2} = \boxed{72x^{13}y^5}$$

$$19) (rs)^3 (2s)^{-2} (4r)^4$$

$$\left(r^3 s^3 \right) \left(2^{-2} s^{-2} \right) \left(4^4 r^4 \right)$$

$$\left(r^3 s^3 \right) \left(\frac{1}{4} s^{-2} \right) (256 r^4) = \frac{256 r^7 s^1}{4} = \boxed{64 r^7 s}$$

$$20) \frac{a^{-3} b^4}{a^{-5} b^5} = \boxed{\frac{a^2}{b}}$$

$$21) (-32)^{\frac{2}{5}} = (-2)^2 = \boxed{4}$$

$$22) \left(\frac{25}{64} \right)^{-\frac{3}{2}} = \left(\frac{64}{25} \right)^{\frac{3}{2}} = \left(\sqrt{\frac{64}{25}} \right)^3 = \left(\frac{8}{5} \right)^3 = \frac{512}{125}$$

$$23) \sqrt[3]{81x^8y^4}$$

$$\sqrt[3]{27x^6y^3} \sqrt[3]{3x^2y}$$

$$\boxed{3x^2y \sqrt[3]{3x^2y}}$$

$$24) \frac{\sqrt{2a^3b}}{\sqrt{6a}} = \sqrt{\frac{2a^3b}{6a}} = \sqrt{\frac{a^2b}{3}} = \frac{\sqrt{a^2b}}{\sqrt{3}}$$

$$\frac{\sqrt{a^2b}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3a^2b}}{3} = \boxed{\frac{a\sqrt{3b}}{3}}$$

$$25) \quad 2\sqrt{8x^3} + 3\sqrt{32x} - x\sqrt{18x}$$

$$2\sqrt{4x^2}\sqrt{2x} + 3\sqrt{16}\sqrt{2x} - x\sqrt{9}\sqrt{2x}$$

$$2 \cdot 2x\sqrt{2x} + 3 \cdot (4)\sqrt{2x} - x(3)\sqrt{2x}$$

$$4x\sqrt{2x} + 12x\sqrt{2x} - 3x\sqrt{2x}$$

$$\boxed{13x\sqrt{2x}}$$

$$26) \quad 4x^{\frac{1}{2}} = \boxed{4\sqrt{x}}$$

Remember: $\frac{\text{Power}}{\text{Root}}$

$$27) \quad \sqrt[4]{3x} = (3x)^{\frac{1}{4}}$$

$$28) \quad \frac{8\sqrt{20x^8} - 4\sqrt{10x^3}}{2\sqrt{5x}} \cdot \frac{\sqrt{5x}}{\sqrt{5x}} = \frac{8\sqrt{100x^9} - 4\sqrt{50x^4}}{2 \cdot 5x} = \frac{8\sqrt{100x^8}\sqrt{x} - 4\sqrt{25x^4}\sqrt{2}}{10x}$$

$$= \frac{8 \cdot 10x^4\sqrt{x} - 4 \cdot 5x^2\sqrt{2}}{10x} = \frac{80x^4\sqrt{x} - 20x^2\sqrt{2}}{10x} = \boxed{8x^3\sqrt{x} - 2x\sqrt{2}}$$

$$29) \quad (w+1)^{\frac{3}{2} \cdot \frac{2}{3}} = 64^{\frac{2}{3}}$$

$$w+1 = 16$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

$$\boxed{w = 15}$$

$$30) \quad \frac{2x^{\frac{2}{5}}}{2} = \frac{32}{2}$$

$$x^{\frac{2}{5}} = 16^{\frac{5}{2}}$$

$$\boxed{x = 1024}$$

$$31) \quad \frac{3y^{\frac{1}{3}}}{+2} - 2 = 4$$

$$\frac{3y^{\frac{1}{3}}}{3} = \frac{6}{3}$$

$$y^{\frac{1}{3}} = 2$$

$$\boxed{y = 8}$$

$$32) 16^{x-1} = 8^x$$

$$(2^4)^{x-1} = (2^3)^x$$

$$2^{4x-4} = 2^{3x}$$

$$\begin{array}{r} 4x-4 = 3x \\ -4x \quad -4x \\ \hline -4 = -x \end{array}$$

$$\boxed{4 = x}$$

$$33) 81^{x+2} = 27^{5x+4}$$

$$(3^4)^{x+2} = (3^3)^{5x+4}$$

$$3^{4x+8} = 3^{15x+12}$$

$$\begin{array}{r} 4x+8 = 15x+12 \\ -4x \quad -4x \\ \hline 8 = 11x+12 \end{array}$$

$$\begin{array}{r} 8 = 11x+12 \\ -12 \quad -12 \\ \hline -4 = 11x \end{array}$$

$$\frac{-4}{11} = \frac{11x}{11}$$

$$\boxed{x = \frac{-4}{11}}$$

$$34) 2^{x+1} = 8$$

$$2^{x+1} = 2^3$$

$$\begin{array}{r} x+1 = 3 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\boxed{x = 2}$$

$$35) \left(\frac{1}{27}\right)^{-x} = 9^{x+2}$$

$$\left(\frac{27}{1}\right)^x = 9^{x+2}$$

$$(3^3)^x = (3^2)^{x+2}$$

$$3^{3x} = 3^{2x+4}$$

$$\begin{array}{r} 3x = 2x+4 \\ -2x \quad -2x \\ \hline \end{array}$$

$$\boxed{x = 4}$$